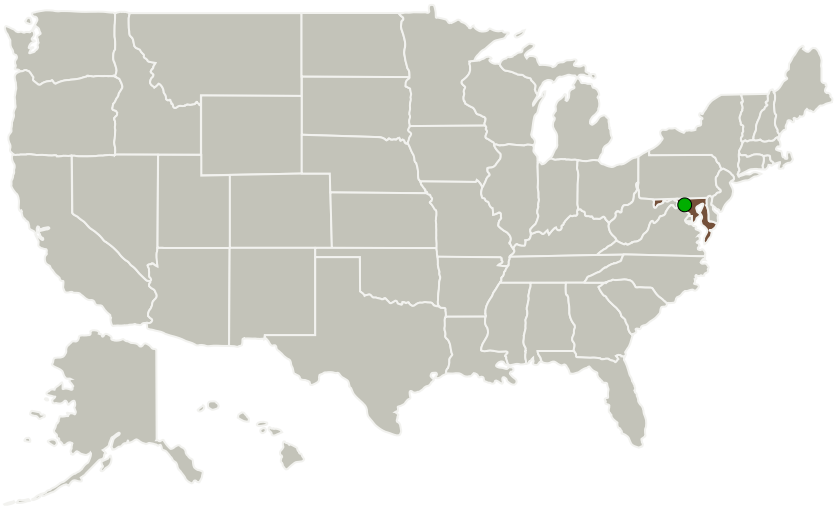
TASS-Enhanced Near Earth Navigation System, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

The need for science-grade Position, Navigation, and Timing (PNT) sensors that are low Size, Weight, and Power (SWaP) is well recognized. The ability to provide precise positioning and pointing in real-time is a capability needed for formation flying, rendezvous and proximity operations, and radio and laser altimetry. To address this need, Emergent Space Technologies will develop a low SWaP codeless GPS receiver that will be capable of precise and real-time orbit determination. Currently, precise orbital determination is performed on the ground since real-time GPS differential corrections won't be available on orbit until they are broadcast by the TDRSS Augmentation Satellite System (TASS). The proposed innovation will combine the capability to receive TASS messages with SCP and the Goddard Enhanced Orbital Navigation System (GEONS) to provide precise PNT capabilities. SCP can track the L1 P(Y) chipping code-phase without an encryption module since it is codeless. Combining this capability with the ability to receive TASS messages in GEONS, on a suitable hardware platform will enable kinematic GPS capable of decimeter-level positioning in real-time. This effort determines how to best integrate these technologies, and to find a suitable host

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Emergent Space Technologies, Inc.	Lead Organization	Industry	Greenbelt, Maryland
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137915)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Emergent Space Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

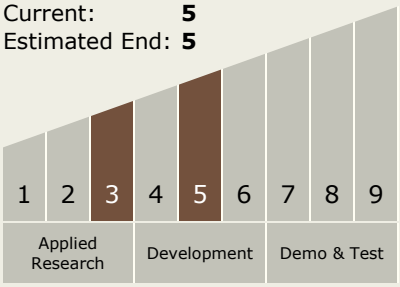
Carlos Torrez

Principal Investigator:

Kenn L Gold

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.2 Navigation Technologies
    - TX17.2.3 Navigation Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System